

## **PRECISION STAR AGES USING DETACHED ECLIPSING BINARIES IN THE KEPLER STAR CLUSTERS**

Eric Sandquist  
San Diego State University  
GO40036

Age is difficult to measure extremely precisely for stars other than the Sun. In the field being observed by Kepler, the stars of the open clusters NGC 6791, NGC 6811, NGC 6819, and NGC 6866 are the ones that can be most precisely age-dated. However, different methods provide ages that differ significantly. We propose an effort to bring methods of stellar age determination into agreement through the use of Kepler data for all of these star clusters. Here we focus on the use of masses and sizes measured from weakly-interacting eclipsing binary star systems. Massive stars run out of hydrogen fuel at their centers before less massive ones, and start to change rapidly in size - for such rapidly evolving stars, measurements of both mass and radius that are precise to 1% can lead to ages precise to 10% or better. Further, mass and radius measurements are conceptually simple to derive from observations, and avoid complicating effects like distance and reddening uncertainties. High precision age measurements from this and other methods will make these star clusters important testbeds for stellar populations in galaxies.